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## FEDERAL COMMUNICATIONS COMMISSION

[PS Docket No. 11-60; DA 12-1153]

9-1-1 Resiliency and Reliability In Wake Of, June 29, 2012, Derecho Storm In Central, Mid-Atlantic, and Northeastern United States; Public Safety and Homeland Security Bureau Seeks Comment

**AGENCY:** Federal Communications Commission.

**ACTION:** Notice.

**SUMMARY:** The Federal Communications Commission (FCC or Commission) is seeking comment on the background, causes, and restoration efforts related to communications services and facilities impacted directly or indirectly by the storm and after. The FCC also seeks comment on the impact these outages had on the various segments of the public, including consumers, hospitals, and public safety entities. This information will develop the record in the Commission's ongoing examination of issues in the April 2011 Notice of Inquiry (NOI) on the resiliency, reliability and continuity abilities of communications network, including broadband technologies. Comments received in response to this public notice will become part of the record of the NOI.

**DATES:** Comments may be filed in the docket for this proceeding on or before August 17, 2012. Reply comments may be filed on or before September 4, 2012.

**ADDRESSES:** Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR 1.415, 1.419, interested parties may file comments on or before August 17, 2012 (comments) and September 4, 2012 (reply comments). Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/>. Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. All filings must be addressed to

the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail to FCC Headquarters at 445 12<sup>th</sup> St., SW, Room TW-A325, Washington, DC 20554.

- The filing hours are 8:00 a.m. to 7:00 p.m.
- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary will be accepted.
- Originals and copies of each official filing must continue to be held together with rubber bands or fasteners. All filings must be submitted without envelopes. See [www.fcc.gov/osec/](http://www.fcc.gov/osec/) for further information on filing instructions.
- Documents sent by overnight mail (other than United States Postal Service (USPS) Express Mail) must be addressed to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- All USPS First Class Mail, Express Mail and Priority Mail should be addressed to FCC Headquarters at 445 12<sup>th</sup> Street, SW, Washington DC 20554.
- To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer and Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).
- Parties wishing to file materials with a claim of confidentiality should follow the procedures set forth in section 0.459 of the Commission's rules. Casual claims of confidentiality are not accepted. Confidential submissions may not be filed via ECFS but rather should be filed with the Secretary's Office following the procedures set forth in 47 CFR 0.459. Redacted versions of confidential submissions may be filed via ECFS. Parties are advised that the Commission looks with disfavor on claims of confidentiality

for entire documents. When a claim of confidentiality is made, a public, redacted version of the document should also be filed.

**FOR FURTHER INFORMATION CONTACT:** Michael Connelly, Attorney, Cybersecurity and Communications Reliability Division, Public Safety and Homeland Security Bureau, (202) 418-0132 or michael.connelly@fcc.gov.

**SUPPLEMENTARY INFORMATION:**

**Questions Regarding Derecho Impact, Effects, and Restoration Efforts**

The Commission poses a series of questions related to the impact of the storm on emergency and 9-1-1 communications accessed by traditional communications networks, broadband communications networks, and wireless communications networks. It also requests comment on the storm's impact on various user groups. The FCC seeks comment on the following issues:

*Causes of Outages.* What were the specific causes of the outages that occurred during or after the storms? Which network elements and components, such as Public Switched Telephone Network (PSTN) trunks, Internet-Protocol (IP) broadband access lines, databases and PSTN switches, were out of service and for how long? For example, to what extent were issues like powering, physical damage, and power surges contributing factors to the outages? To what extent are there industry best practices that address these, and any other, contributing causes? To what extent were they followed?

In what ways was physical damage due to the storm a major cause of outages? What could be done to improve the resiliency of communications infrastructure in the face of physical damage like what was seen during the storm? Are there actions the communications industry can take to avoid or mitigate these outages in future similar events? Should the FCC take other steps to improve communications resiliency during strong storms like this?

In what ways was the derecho an “extraordinary” event? For example, compared to other types of disasters, did it occur with unusually short notice, affect an unusually large area, and was it unusually intense? How did these factors inhibit service providers in responding to the event and restoring service? How did these factors affect consumers’ need for communications services and ability to obtain emergency services? What could be done to better prepare for events like this in the future? Specifically, what actions should communications service providers and PSAPs take to better prepare for similar events in the future?

How did service providers become aware that 9-1-1 outages had occurred? What types of monitoring systems were in place for various types of assets, both in the field and inside buildings? How well did these monitoring systems perform during the storm?

What role did the availability or absence of back-up power for network equipment play in the 9-1-1 outages that occurred during the storm? What could be done to improve the ability of communications assets to operate longer when commercial power is lost? Are there new technologies, such as solar and fuel cells, which provide promise in this area? What maintenance practices are in place to compensate for the loss of commercial power? How did these methods perform during the storm? Are there actions the FCC should take to improve the ability of communications networks to survive commercial power outages? What types of measures could be taken to improve the robustness of communications infrastructure in response to failures of commercial power? Should the Commission consider taking action, either voluntary or mandatory, that would address back-up power?

What forms of network interconnection, both PSTN and IP, were affected by the storm or loss of power? How and why were they affected? Did these disruptions affect communications seeking 911 or other emergency assistance and how? What carrier and public safety facilities have multiple means or forms of interconnection and which do not? Which of these facilities are essential for 911 communications? What monitoring of interconnection was in place and how did

it perform? To what extent are there industry best practices addressing forms of interconnection and diversity and redundancy? To what extent were they followed?

Effect on 9-1-1 Systems and Services. What could be done to improve the reliability of the 9-1-1 network when faced with storms like the derecho or other threats? Are there actions the FCC should take to improve the reliability of 9-1-1 services during strong storms like this? What actions should communications service providers take? Are there actions that communications service providers and/or PSAPs should take to improve the 9-1-1-restoration process? What, if anything, can the FCC do to better assist communications service providers and PSAPs in the restoration process?

How was 9-1-1 call completion affected by outages caused by the storm? Is there an estimate of how many 911 calls could not be completed at all or only through alternate means, such as ten-digit numbers? To what extent do industry best practices exist that relate to these events, and were these best practices followed? Were there instances where PSAPs went offline due to failures on their own premises? To what extent did the storm affect Automatic Number Identification (ANI) and Automatic Location Identification (ALI)? What were the primary causes of failures to ANI and ALI services? To what extent were vital 9-1-1 facilities and network elements deployed redundantly by service providers? For example, were selective routers routinely deployed in a diverse manner? Likewise, were facilities that carry ALI and ANI information routed in a diverse manner? What should be done to improve the diverse provisioning of 9-1-1 facilities and elements?<sup>1</sup>

Effect of 9-1-1 Outages. What impact did the 9-1-1 outages have on the public? For example, how were consumers affected? How did the outages affect the ability of public safety officials to perform their duties? How was the public alerted of the 9-1-1 outages and what

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<sup>1</sup> *Public Notice*, FCC's Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of the Importance of Implementing Established 9-1-1 and Enhanced 9-1-1 Best Practices, DA 12-891, rel. June 6, 2012.

alternatives were provided? How effective were these alternatives? To what extent was social media used to spread the word about the 9-1-1 outages and alternatives? What impact did the 9-1-1 outages have on other sectors of the user community, including businesses and providers of critical services, such as hospitals?

*Effect of Communications Outages on Access to 9-1-1 Services.* Outages in the 9-1-1 network itself are only one way that users can be denied access to 9-1-1 services. For example, if the PSAP is operational and the 9-1-1 network is functioning, users in a local area will still be unable to reach the PSAP if they lack access to the communications network due to a local outage. To what extent did users find that the general unavailability of communications service impaired their ability to access 9-1-1 service? In these instances, were multiple methods of reaching the PSAP available, like cell phones or other types of communications services? How effective were these alternative communications services in overcoming outages affecting one access platform? What should be done to improve the diversity of access to 9-1-1 services so that communications outages are less likely to result in an inability to access 9-1-1?

### **Questions Regarding 9-1-1 Resiliency and Reliability Generally**

The 9-1-1 communications failures experienced as a result of the derecho also give rise to concerns and questions about the reliability and resiliency of our 9-1-1 communications networks nationwide, particularly in the event of a severe weather or other type of high-impact natural disaster. The FCC seeks comment on how 9-1-1 communications has fared during other recent natural disaster events. Please describe any lessons learned from those events, in particular improvements that were recommended to improve 9-1-1 service reliability and survivability. Commenters should address the impact on communications relying on the PSTN- and IP-based communications, as well as fixed and mobile wireless communications.

The FCC also seeks comment on the most common causes of failure in the 9-1-1 network that result in the following types of 9-1-1 outages: i) complete isolation of the PSAP; ii) failure

to pass ALI and/or ANI; iii) loss of the ability to re-route traffic to an alternate PSAP or administrative lines. What could be done to reduce the incidence of outages in each category? What actions, if any, should the FCC take to address this problem?

In what ways does the practice of deploying redundant facilities or systems used in the 9-1-1 network promote 9-1-1 reliability? How does the service provider ensure that these practices are followed routinely and remain in place over time, even as changes are made to the networks? What, if anything, should the FCC do to promote the application of such methods?

How do service providers routinely monitor 9-1-1 facilities and the availability of 9-1-1 service? How quickly do service providers become aware of 9-1-1 failures of various kinds? Do service providers routinely notify PSAPs of 9-1-1 outages? How are they alerted, under what conditions, and how quickly? What steps does the service provider take routinely to prioritize restoration of 9-1-1 service? What standard operating procedures and systems does the service provider have in place to facilitate the detection and restoration of 9-1-1 service after an outage? Are these resources adequate?

PSAPs are typically small operations playing a large role in protecting the safety of the public. The failure of a few trunks into a PSAP could affect public safety for an entire community, but the failure of just a few trunks might not attract much attention from a service provider. Do provider alarm systems provide adequate visibility to relatively small outages that can have a large impact on PSAPs, especially when demand may spike, such as during or after a major storm? Do providers provide appropriate urgency to handling such outages?

To what extent is the availability of multiple access platforms (*e.g.*, residential telephone line, whether legacy or IP-based, cell phone, *etc.*) to reach networks services creating greater richness of diversity that would tend to improve 9-1-1 reliability? Stated differently, to what extent does the public have more than one way to reach 9-1-1 that are not reliant on each other?

To what extent are available access platforms reliant on each other or another common point of failure?

The legacy communications network uses a hierarchical architecture, whereby failures of network elements located deeper in the network will result in a larger number of customers being denied network service. For this reason, elements deeper in the network (*e.g.*, switches) were often designed to very high reliability specifications. To what extent has the legacy infrastructure retained this characteristic? Today's networks are quickly migrating to broadband IP technology. To what extent does the migration to IP-based networks reduce or increase the level of concentration deeper in the network? What is the resultant impact on communications reliability?

What other steps might service providers take? What actions should PSAPs take? What other actions, if any, should the Commission take to encourage those steps? What actions should the public and other institutions like hospitals take, if any? We seek comment on whether the deployment of Next Generation (NG911) will improve the reliability of 9-1-1 services and, if so, how? Would NG911 make it easier to have more than one backup PSAP and provide additional redundancy of transmission facilities, *e.g.*, via satellite or microwave point-to-point links? Did commercial data centers in the affected areas experience outages and for how long? Would it increase reliability if critical components of the NG911 system are housed or replicated in commercial data centers?

NG911 will create the ability to utilize a "virtual PSAP." Today's 9-1-1 system generally requires a call taker to answer a 9-1-1 call from within the walls of a single physical ("brick and mortar") PSAP. In a NG911 network, however, a call taker will be able to answer a 9-1-1 call from virtually any location. The FCC seeks comment on the potential for development of virtual PSAPs. Are current technologies sufficient to support virtual PSAPs? Are there specific steps that service providers should take to ensure that they have adequate reliability when



implementing NG9-1-1? How would the addition of a 9-1-1 text capability provide substantial improvement in the ability of consumers to contact PSAPs?

FEDERAL COMMUNICATIONS COMMISSION

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